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Daryl Hammock, assistant manager at Charlotte-Mecklenburg Storm Water, outside of the Government Center in uptown Charlotte, North Carolina. The utility's multi-pronged approach to stormwater control has helped mitigate flooding problems in the fast-growing city. (Photography by Logan Cyrus)



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Luke Laggis

## BETTING ON SUMMER

Working through the storms makes the sunny days that much more enjoyable

I hope July is worth it. On May 1 it's snowing in northern Wisconsin, with a few fresh inches on the ground and the wind just knocked my power out.

This was the snowiest winter in Wisconsin's history, but it's a place where you put up with long winters for the summer and fall. Sometimes you don't even get a spring. Winter simply hangs on until summer can't be stopped. And when it arrives it brings an effortlessness and sense of freedom.

I imagine it's similar to how you feel when a major project is completed and you no longer have to worry about a transmission main you know is ready to burst, or fear every forecast that calls for rain.

The stormwater utilities in Frisco, Texas, and Charlotte, North Carolina, understand that fear of rain. Explosive growth in both communities combined with construction and more impervious surface has heightened the

challenge of protecting local waterways and alleviating flood concerns.

In Frisco, approximately 140 miles of streams ramble through the community's boundaries. Beneath the surface of the city, water is channeled through 889 miles of stormwater pipe. When challenges arise, the department takes an innovative approach.

When a fallen tree in a local creek threatened a downstream sewer line crossing, the department repositioned the tree and anchored it in place to protect an eroded section of the bank. When the city built a parking lot in 2015, the stormwater division created a different kind of absorption area as a demonstration of the advantages of using native plants and native soil in the zones. When beavers kept blocking a stream, they cut a passage through the dam and ran a culvert through it. It kept the water flowing and the beavers eventually gave up and moved on. When they needed a better — and more affordable — solution for collecting trash from streams, they designed and built their own debris catcher. It's been so effective that the North Texas Council of Governments sent their engineers to study the structure so it could be replicated and offered to other municipalities in the council.

In North Carolina, Charlotte-Mecklenburg Storm Water Services has taken on its fair share of stream improvements, too. The Reedy Creek project, which included 5 miles of stream restoration and nearly 3 miles of stream enhancements, raised the eroded stream bed and reconnected it with a 4-acre wetland that helps filter out pollutants. The utility's Cedars East Storm Drainage Improvement Project, designed to mitigate flooding in a flood-prone residential neighborhood, was named the North Carolina Stormwater Project of the Year by the American Public Works Association.

**Both utilities are making huge strides in protecting local water resources and eliminating the fear of flooding.**

Both utilities are making huge strides in protecting local water resources and eliminating the fear of flooding.

And that's the thing, part of why summer is so good here in Wisconsin is because we deal with the cold of winter in order to get there. Stormwater awards mean more when you've suffered through the floods en route to making your communities more resilient.

Here's hoping today's struggles lead to a better tomorrow.

Enjoy this month's issue. ♦

Comments on this column or about any article in this publication may be directed to editor Luke Laggis, 800-257-7222; editor@mswmag.com.

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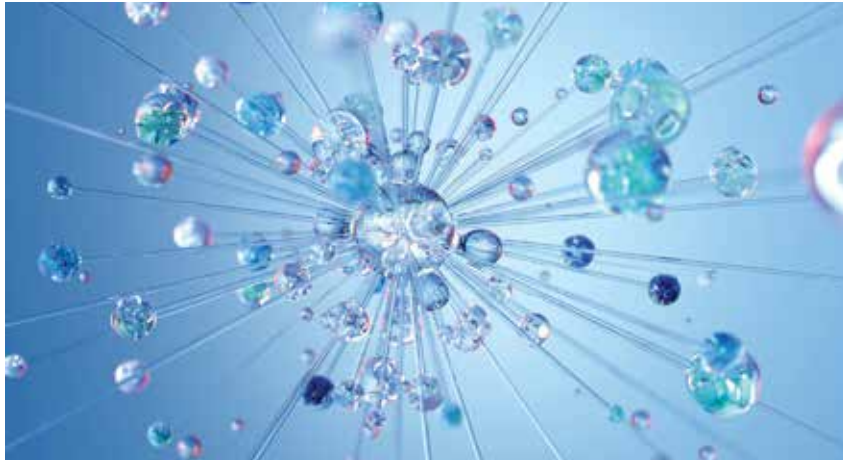
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### How AI Chatbots Can Help

Two water engineers working with the University of California-Berkeley's Data Science Discovery program believe artificial intelligence can help California Water Resources Board staff discern, communicate and enforce rules to ensure the public's water is safe to drink. Read more about it in this online article. [mswmag.com/featured](https://mswmag.com/featured)



## EMPHASIZING CONSERVATION

### Utility Hosts Garden Fest

Based in Montclair, California, the Chino Basin Water Conservation District hosts an annual fall garden and pumpkin festival to educate residents about water-saving plantings and responsible gardening practices. Amid frequent droughts, the residents appreciate learning how they can do their part to conserve water. [mswmag.com/featured](https://mswmag.com/featured)

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### Research Reveals Struggle

In 787 communities served by the United States' largest utilities, 17% of households struggle to afford basic water services, according to a new analysis by researchers at Duke University. Nearly half the U.S. population lives in the communities covered by the study — a two-year effort that quantifies the water affordability challenge and offers solutions. [mswmag.com/featured](https://mswmag.com/featured)



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# PROGRESSIVELY MORE PROTECTIVE

North Carolina utility takes a multipronged approach to maintaining clean creeks, streams and lakes

By **Ken Wysocky**

Through massive investments in stormwater-control projects in Charlotte, North Carolina, the Charlotte-Mecklenburg Storm Water Services utility is proactively taking steps to mitigate the flooding that used to plague parts of the fast-growing city and the surrounding county.

The utility — actually comprised of two joint organizations, Charlotte Storm Water Services, which serves the city of Charlotte, and the Mecklenburg County Storm Water Services, which serves the county and six surrounding towns — also is charged with protecting the Catawba River from contaminants in stormwater runoff. The 224-mile-long river is a vital artery that serves as the primary drainage center for the region’s watershed and supplies drinking water to more than 2 million people in North and South Carolina.

The joint utility relies on a multipronged approach that includes replacing aging storm-drainage infrastructure with larger-capacity pipes; restoring failing creeks and streams, many that drain into the Catawba River; and building wetlands, detention basins, rain gardens and other stormwater-control measures that retain and then filter rainfall as it’s slowly dispersed into creeks and streams, says Daryl Hammock, CSWS assistant manager.

“Charlotte is a booming city — one of the fastest-growing in the country,” Hammock says. “We have a lot of development going on — homes, businesses, shopping centers and so forth — and all the impervious surfaces that come with those kinds of developments generate a lot of stormwater runoff.”

In fact, as of 2021, there were 2.2 billion square feet of roads, parking lot, rooftops and other impervious surfaces in the city of Charlotte alone. Just an inch of rainfall in the city, which covers about 300 square miles, equates to more than 5 billion gallons of water, according to CMSWS statistics.

“We want to be sure that the runoff is as clean as possible when it reaches local creeks and streams,” Hammock says. “Our mission is to underpin a thriving city with sound infrastructure and clean creeks, streams and lakes.”

Another facet of the ongoing flood-mitigation and

water-quality efforts is stronger regulations implemented over the years, including one that require developers to fund and build their own stormwater-control measures on real estate they’re developing.

“Over the years, we got smarter on the land-development side,” Hammock says. “We put in place better regulations that help prevent problems. We’ve progressively gotten more and more protective.

“In the end, it’s a lot cheaper to prevent problems than it is to fix them.”

## Open and closed systems

The utility’s stormwater system features 3,800 miles of “closed systems” (underground storm sewers) and 2,400 miles of “open systems” — things like ditches, creeks and streams. The area’s sewers aren’t combined, so there’s no need to treat stormwater at a facility.

“These components all work together, with stormwater going back and forth between open and closed systems,” says Hammock. “This kind of system is very common in the South.”

That system is supplemented by approximately 2,000 stormwater-control measures built by either the utility or by private entities. They collect stormwater from about 11,000 acres of paved surfaces — almost one-fifth of the city’s roughly 61,000 acres of impervious surfaces.

Before the utility was formed in 1993, there was no cohesive stormwater-management strategy in place. The result was frequent flooding of streets, homes and businesses as the city rapidly grew, Hammock says. (On average, Charlotte receives 43 inches of rain annually.)

“People didn’t like that, so the



## PROFILE:

**Charlotte Storm Water Services, Charlotte, North Carolina**

**SERVICE AREA:**  
City of Charlotte

**POPULATION SERVED:**  
About 800,000 people

**RAINFALL:**  
Average of 43 inches a year

**INFRASTRUCTURE:**  
3,800 miles of storm sewers; 2,400 miles of ditches, creeks and streams; more than 150,000 storm drains

**MAJOR WATERSHEDS:**  
18

**EMPLOYEES:**  
More than 200

**WEBSITE:**  
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**A double-barrel box culvert safely guides rainwater runoff under the housing development at the Cedars East Storm Drainage Improvement Project in Charlotte, North Carolina. The project wrapped up in 2021 and has eliminated flooding issues from creek runoff. (Photography by Logan Cyrus)**



**“We want to be sure that the runoff is as clean as possible when it reaches local creeks and streams.”**

Daryl Hammock

Daryl Hammock, assistant manager at Charlotte-Mecklenburg Storm Water, outside of the Government Center where their office is located in uptown Charlotte, North Carolina.





**Matt Gustis, director of the Engineering and Design Division at Charlotte-Mecklenburg Storm Water Services visits the Cedars East Storm Drainage Improvement Project in Charlotte, North Carolina. The project was completed in 2021 and has eliminated flooding issues from creek runoff.**

CMSWS was created to address the problems,” he explains.

The utility also was charged with improving the quality of surface water to meet standards the 1972 federal Clean Water Act set.

“Through public and private investments, we’ve mitigated more and more pollution sources,” he points out. “But we still have a long, long way to go.”

CMSWS projects are funded with user fees assessed on every property with

impervious surfaces. The more impervious surface there is on a property, the higher the fees.

“A shopping mall might pay thousands of dollars a month while a homeowner might pay \$10 a month,” Hammock says. “The fees were controversial back then, but we needed a funding source to mitigate flooding and contain pollution sources from stormwater run-off in order to comply with Clean water Act requirements.”

### **Award-winning project**

The Cedars East Storm Drainage Improvement Project, completed in late 2021, exemplifies the utilities’ efforts to upgrade stormwater-control systems. The project was named the North Carolina Stormwater Project of the Year by the American Public Works Association.

The \$8.1 million project, which started in September 2018, is designed to mitigate flooding in a largely residential, flood-prone neighborhood, located just southeast of downtown Charlotte. It should protect residents from living-space flooding in up to a 100-year storm, explains Matt Gustis, engineering and design division manager.

“The infrastructure in the neighborhood was built in the 1950s and was reaching the end of its useful life, so we wanted to get ahead of that,” Gustis says. “We also wanted to ensure there was a sustainable and sta-

## **PROACTIVE INFRASTRUCTURE MANAGEMENT**

For years, Charlotte Storm Water Services operated without a formal asset management program.

The end result? “We basically responded to a lot of emergency calls,” says Kate Labadorf, division manager of strategic planning and operations. “We were very much in a reactive mode.”

That ended in 2016 when the utility implemented an asset management plan focused on regularly inspecting stormwater sewers and prioritizing components that needed replacement or repairs. The utility pays city crews to clean the pipes.

“We’ve basically become much more proactive over the years,” she says.

The utility relies on two camera trucks outfitted with CUES pipeline-inspection camera systems, and has a third truck on order. Each truck performs about 45,000 linear feet of inspections a year and the division is responsible for about 1,400 miles of pipes.

Contractors are hired to handle any overflow work, but Labadorf is hopeful the addition of the third truck will eliminate that practice.

The first step in the asset management program was inspecting what CSWS officials defined as critical assets — culverts that are 48 inches in diameter and stormwater sewers that are larger than 54 inches in diameter and lie under city-maintained streets. The city has 18 miles of culverts larger than 48 inches in diameter and 13 miles of pipes larger than 54 inches in diameter, she reports.

“We decided that those pipes are our most critical assets, so that’s where we started,” she explains. “We’ve completed manual inspections of all of them, using confined-space entry. Cameras provide good information, but they’re not quite as good as a manual inspection.”

Going forward, the utility plans to inspect these larger assets every two years if problems are found and every five years if they’re in good condition, she says.

The next phase of inspections centered on pipes 30 inches in diameter and larger (but smaller than 54 inches). The goal is to inspect those pipes every 10 years.

“We’ve only been doing that for a year and we’ve inspected more than 10 miles of pipe, with roughly 250 miles left to do,” she says.

The utility is not inspecting pipes smaller than 30 inches in diameter.

“We’re running those until the end of their lifespans,” she explains, pointing out that inspecting those smaller pipes can be more expensive than just fixing them when they fail. Since 2018, the utility also has been performing post-construction inspections of new pipeline installations.

“We’ve found it’s very beneficial to video pipes after they’re installed to make sure it looks right — that the joints are secure and there’s no broken pipe or debris left behind,” she explains. “We want to be sure that what contractors put in the ground is acceptable.”

“We also require developers to video their pipes before we take them over for maintenance,” she continues. “We don’t want to inherit problems with newly installed pipes.”

The utility’s overall asset management goal is to better understand the stormwater system and maintain it better, too, which minimizes emergency-repair calls.

“We want to be sure we’re putting our money to the best use on the highest priorities,” Labadorf says. “By being prepared and proactive, we are spending money wisely.”





A lift point is seen on a portion of a storm water pipe at the site of the North Davidson stormwater project in Charlotte, North Carolina. The project will help convey runoff from nearby developments into a smaller local stream.



A crew installs drainage infrastructure during the beginning phases of the North Davidson storm water project.

ble drainage system.”

The system captures water that drains from a 256-acre area and then flows into a creek that eventually leads to the Catawba River. The primary component of the approximately 1-mile-long system is a roughly 1,650-foot-long double box culvert that provides more stormwater capacity; each of the side-by-side culverts is 8 feet wide by 4 feet tall and is buried about 11 feet deep.

The system also includes a 95-foot-long triple box culvert — two of them 8 feet wide by 4 feet tall and one 10 feet wide by 7 feet tall — that passes under a road at the other end of the project. The culvert system is designed to withstand a 50-year rainfall, Gustis notes.

“It was a complicated project because we had to maintain vehicle and pedestrian access to an apartment complex,” he says. “There also were a lot of utility lines that we had to either work around or relocate, plus we had to install a lot of shoring because some of the pipe system was so close to buildings.”

The city experienced some fairly large rainstorms recently, with no flooding reported in the neighborhood, Gustis says.

### Improving surface-water quality

Another flood mitigation endeavor, called the Reedy Creek project, illustrates an important aspect of the utility’s water-quality strategy: restoring creeks that have been scoured and no longer sustain aquatic habitat like they should because of silt from erosion. The \$8 million project, located northeast of downtown Charlotte, started in February 2014 and was completed in February 2019.

“Reedy Creek was an impaired stream due to siltation — it was no longer a thriving ecosystem,” Gustis explains. “Fixing it required more than 5 miles of stream restoration and nearly 3 miles of stream enhancements.”

The main issue was that the stream bed had sunk lower than the surrounding floodplain. So it had to be raised to reconnect it. That, in turn, allowed the utility to restore about a 4-acre wetlands area — another critical part of retaining rainfall and letting nature filter out contaminants

stemming from stormwater runoff.

“We also put easements around the wetlands area to protect it in perpetuity from the impacts of future redevelopment activity,” Gustis adds.

The project now is under a five-year monitoring program that includes checking the new in-stream structures, vegetation health and water quality. After five years, the vegetated stream buffer should be fully established, which will complete the restoration.

One of our biggest problems with water quality is stream-bank erosion,” says Hammock, noting that stream restorations play a big role in improving surface-water quality. “People straighten out creeks, cut down trees and destroy stream buffers and developers sometimes even move creeks.”

When combined with an ever-increasing volume of stormwater runoff over the past decades and the highly erodible clay soil that’s common in North and South Carolina, the end result is more and more erosion of stream banks.

### Substantial progress

Hammock notes that much has been accomplished since the joint utility was formed. Since 1998, CSWS has restored nearly 45 miles of streams. Furthermore, as part of a buy-back program to reduce damages from flooding, the county utility demolished 458 buildings in floodplains during that time, which led to 194 acres of reclaimed open space. The county also planted more than 18,000 trees.

In 2022 alone, CSWS spent \$89 million in capital improvements (including nine major drainage-improvement projects at a cost of \$35 million), reviewed more than 4,300 plans for private development, completed more than 5,000 erosion-control inspections, installed more than 22,200 feet of stormwater pipes; inspected more than 300 culverts and drainage pipes and rehabilitated more than 11,500 feet of pipe, according to a 2022 annual report.

The bottom line: The flood mitigation efforts are working.

“We have a lot less flooding compared to, say, 20 years ago,” Hammock says. “We have a much more thorough knowledge base for our drainage

**“We have a much more thorough knowledge base for our drainage system, our pipe capacities, which ones have been replaced and so forth.”**

Daryl Hammock

system, our pipe capacities, which ones have been replaced and so forth.

“We also now can track how much of our system we inspect and maintain every year. We have a much better handle on all of our assets than we had years ago.”

Nonetheless, the utility’s work is never done, he says. In fact, according to the utility’s website, there are more than four dozen projects in the works.

“We continue to put a lot of energy into making sure new construction doesn’t cause flooding or surface-water problems,” Hammock says. “Our biggest task is to just keeping up with growth and all the land-use aspects that go along with it.

“But we’re up to the challenge.” ♦

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# CHANGING THE OPERATIONAL MODEL

New Mexico's largest water utility optimizes system with seamless technology integration

By Joseph Dryer

The Albuquerque Bernalillo County Water Utility Authority is the largest water utility in New Mexico, with a team of 148 employees serving more than half a million people. Crews have always responded to service issues as they were reported, but the utility realized that this approach wasn't sufficient amid growing demand in New Mexico's most populous county.

The utility began examining their internal operations in an effort to reinforce their commitment to providing customers with clean, drinkable water. One issue that surfaced was the water service interruptions for some customers.

## Continuous improvement

The water service provider quickly recognized the need for improvement, and the staff began looking for ways to prioritize what to tackle first. Better pressure management became a focus. Finding more proactive methods to manage water pressure across the service territory meant the utility could reduce the amount of water loss they saw each year, leading to lower costs and a more efficient use of staff time.

This led to a reinvigorated approach to water service in order to improve efficiency, performance and customer service. The utility turned to digital solutions to begin shifting their methods for water pressure management, device monitoring and issue response. These remotely managed solutions laid the groundwork for seamless application integration and other upgrades to the water system in the years to come.

"The goal is to install 20,000 to 25,000 endpoints each year so that our entire system will rely fully on advanced metering infrastructure within three to four years," says Joel Berman, chief engineer of the water authority.

In 2011, the authority began utilizing smart water technology from Sensus, a Xylem brand. Most recently they've added another layer of technology to continuously monitor and manage water pressure in near real-time, all from the convenience of their offices.

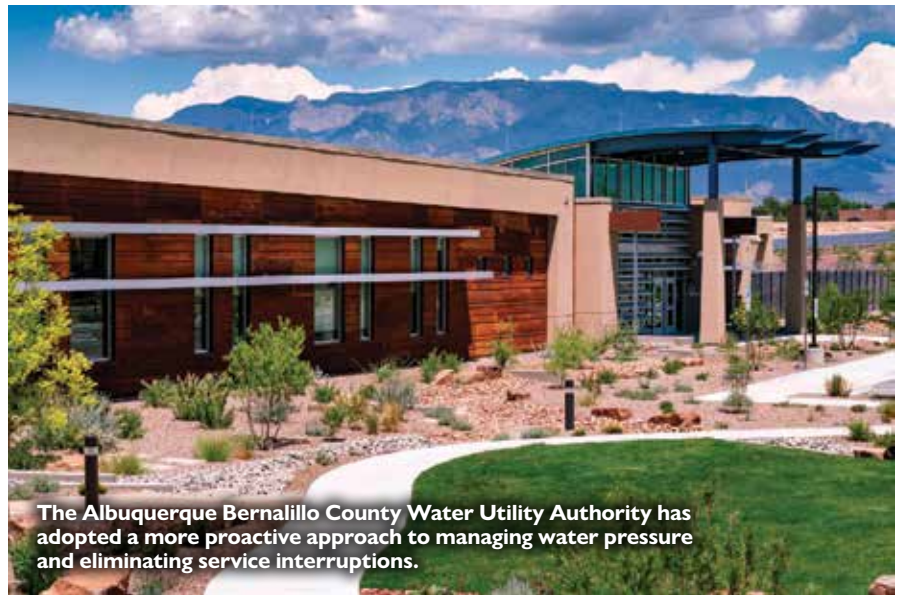
## Seamless integration

"When it comes to water pressure management, proactivity is key," says Berman. "We keep our customers happy by remotely monitoring their water consumption and pressure to ensure any potential issues are identified before they experience them."

The residential water meters report pressure data into the easily accessible, cloud-hosted Sensus Analytics Pressure Profile Application.

**"This technology has taken many steps out of our typical pressure management process, including administrative tasks and truck rolls."**

Patrick Bayardo



The Albuquerque Bernalillo County Water Utility Authority has adopted a more proactive approach to managing water pressure and eliminating service interruptions.

"This technology has taken many steps out of our typical pressure management process, including administrative tasks and truck rolls," says Patrick Bayardo, an operations and maintenance superintendent at the water authority. "Now, we simply log into the website in the morning and the data is right at our fingertips. It's a big time-saver for us."

The application works with the FlexNet communication network to provide seamless data collection from residential meters in the service territory. The data is then presented in easy-to-understand map-based graphs that show pressure zones and levels within the community at any given time. Utility personnel receive automated alerts when pressure deviations occur.

"A customer noticed his new irrigation system was experiencing lower pressure than usual and just stopped working," Berman says. "Using Pressure Profile, we were able to identify, resolve and restore the system pressure quickly — in only



The water authority has added the battery-powered Sensus Smart Gateway Sensor Interface at pressure reducing valve sites to monitor water distribution system performance.

## BETTER MOUSETRAPS

### PROBLEM:

Escalating service interruptions for water customers.

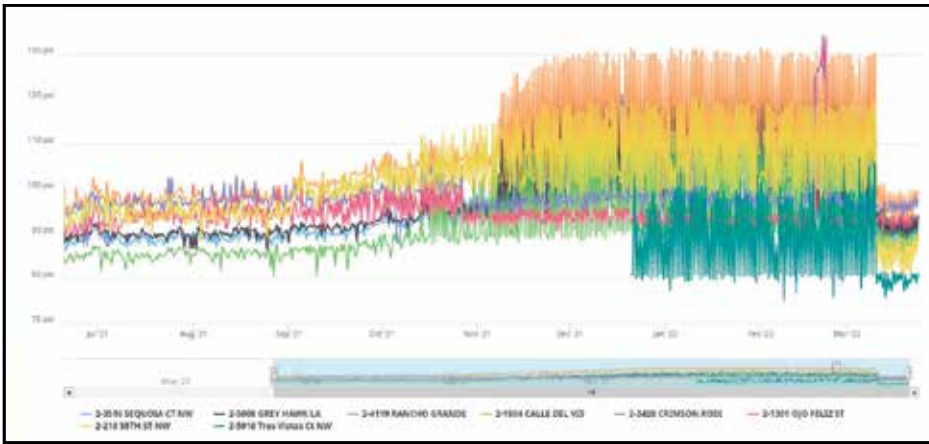
### SOLUTION:

Better pressure management and system monitoring.

### EQUIPMENT:

Smart water technology from Sensus, a Xylem brand, including the Sensus Analytics Pressure Profile Application, Sensus Smart Gateway Sensor Interface, and the FlexNet communication network.





**A FlexNet report shows midnight pressure spikes in the water system.**

a matter of hours. The customer was grateful, and it was a positive experience for everyone involved.”

### Optimizing performance

The water authority also added the battery-powered Sensus Smart Gateway Sensor Interface at pressure-reducing valve sites to monitor water distribution system performance. The sensors, ally meters and pressure management software work within the FlexNet system to locate the cause of ongoing pressure spikes.

“We discovered an open valve — not mapped on our system — that was overpressurizing from one zone to another,” Bayardo says. “Pressure Profile brings us the data we need in the timeframe we need it to troubleshoot and optimize each pressure zone for optimal performance.”

Berman says it’s been a seamless solution that technicians have adopted, installed and programmed without third-party assistance.

### Efficient operations

The efficiency and convenience of smart water solutions have enhanced the water authority’s workflow. According to Bayardo, shifting from a “boots-on-the-ground” approach to digital technology where the data is readily available has saved the utility service calls and routine maintenance.

**“Now we can pinpoint areas and resolve potential water pressure issues within hours, when it used to take weeks.”**

**Patrick Bayardo**

“Now we can pinpoint areas and resolve potential water pressure issues within hours, when it used to take weeks,” Bayardo says.

The utility was an early adopter of smart water technology and hopes to continue improving operations.

“I’m proud to say that in the last decade we’ve collectively transitioned from being reactive to highly proactive with regards to water distribution pressures,” Berman says. “These days, if we don’t identify an issue before the customer, something is wrong. It’s not just about monitoring the pressure, it’s about changing the way we do business.”

### More work to do

The water authority is always seeking ways to improve. In the coming years, they plan to dig deeper into their advanced pressure management data for hydraulic model verification to further improve both water loss and quality — and to meet their goal of having their entire system rely fully on AMI. ♦



*Joseph Dryer is a product manager of utility solutions with Sensus, a Xylem brand.*

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# READY FOR THE RAIN

Frisco expertly manages stormwater and protects resources through explosive growth

*By Giles Lambertson*

In the first two decades of the 2000s Frisco, Texas, was swallowed up by the Dallas-Fort Worth metroplex, becoming both a corporate center — think Dallas Cowboys — and a bedroom community for commuters heading to one city or the other. From a population of 33,000 in 2000, according to U.S. Census figures, Frisco swelled to 210,000 residents in 2023 and still is growing.

All of these developments could be a threat to the local lakes that provide water for more than 5 million people. Frisco is doing its part to avoid having the detritus of urban development ruin the area’s growth experience. The city’s stormwater department is doing such a good job, in fact, that it took home top honors from the 2022 Water Environment Federation’s Stormwater and Green Infrastructure awards program.

The gold medal awards annually cite municipal separate stormwater systems that are especially well-managed and innovative. Frisco was declared the overall winner in Phase II (larger) cities, which included places like St. Louis and Richmond, Virginia.

The honors to the city came on Perry Harts’ watch. Harts has been Frisco’s stormwater manager for a dozen years, so he has been there for much of the community’s mushrooming growth. Frisco was, in fact, deemed for several years to be the nation’s fastest growing city, that distinction coming as late as 2017.

Needless to say, all the growth and expansion poses a huge pollution risk to streams leaving Frisco. “Construction is an enormous factor for us. That has been the biggest specific challenge,” Harts says.

About 1,400 building permits are active in the city at any given time and hundreds of civil engineering projects are undertaken annually. “These pose enormous risk for our streams,” Harts says. “We spend most of our time ensuring controls are in place and contractors are in compliance.”

The department conducts two kinds of inspections — the first of actual infrastructure construction areas and other work sites to inspect runoff mitigation efforts, the second of paperwork to see if contractors are in regulatory compliance.

“Just making sure contractors are familiar with the regulations, that’s the hard part,” says Christopher Collis, the department’s inspections supervisor.

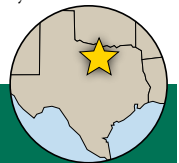
## Innovative thinking

The waters the department is trying to protect are both visible and out of sight. Some 140 miles of rippling streams ramble through the community’s boundaries. Beneath the surface of the city, water is channeled through 889 miles of stormwater pipe. Harts notes that “any manmade infrastructure requires a lot of attention. In comparison, natural streams have been running along for thousands of years and require very minimal work.” Still, both situations need managing and Frisco’s stormwater department is on top of it.

As for the innovation piece of the environmental awards, it’s easily explained: Harts and his crew like to try new things. From fallen trees to beaver dams, the department often responds in novel ways.

Example: A tall hardwood tree on the edge of a stream was uprooted and fell into the creek bed. “The tree was upstream of a sewer line that crosses the creek,” Harts explains. “Our concern was that it could float downstream and break the sewer line. We at first figured we would chop up the tree and remove it, but upon looking at it, we decided to use it.”

Specifically, the fallen tree was repositioned and anchored in place. Subsequent rainstorms deposited silt in and around the tree’s trunk and branches and began to rebuild the



## PROFILE: Frisco Stormwater Management Division

**SERVICE AREA:**  
70 square miles

**STORMWATER  
INFRASTRUCTURE:**  
889 miles of pipe, 142 miles of open stream, 1,342 manholes and 23 stormwater ponds totaling 61 acres

**STORMWATER EMPLOYEES:**  
16

**WEBSITE:**  
[www.friscotexas.gov/490/stormwater](http://www.friscotexas.gov/490/stormwater)





Sean Aucoin, Brandon Smith, Perry Harts and Chris Collins of the Frisco Stormwater Management Division stand near a restored creekbank. (Photography by Olivia Ogren-Hrejsa)



The Frisco Stormwater Department's new F-150 hybrid truck has a drone launchpad installed on the truckbed, allowing inspectors to easily launch the drone from any area.



so we took out the pipe. It wasn't needed anymore."

Perhaps the department's single most innovative achievement is what Harts calls "one of the neatest projects. Our trash rack." It was conceived and built because the city's environmental permit requires collection of "floatables" — both constructed and natural floating debris. When the collector was needed, rather than spend a hundred thousand dollars on a commercial concrete structure, the division team built one.

The structure was crudely sketched out by a crew member and fabricated in the shop. The tubular iron structure consists of two hinged open-faced gates that meet in the middle, with heavy-gauge plastic trash bags affixed to the downstream side of them. As the water trickles through them, floating debris is culled and deposited in the bags, which are periodically replaced.

During periods of normal stream levels, concrete parking abutments placed on either end of the gates funnel the shallow stream of water to where the bags can catch the floatables. In heavy rain events, the gates swing open rather than block the flow and are reset afterwards. In 2022, the device captured about a ton of floating debris.

"It is effective and efficient," says Harts, who is a professional engineer. He's not alone in his estimation. The North Texas Council of Governments sent their engineers to study the structure and replicated its design in fine-drawn detail. The debris-catcher solution then was offered to municipalities in the council. While it isn't patented, Harts says Frisco worked with a patent attorney to ensure that the design would remain in the public domain.

### Deeper layers

The entire stormwater department in Frisco numbers 16 people. Six of them are dedicated to maintaining the system, whether underground or in plain sight.

The department equipment yard contains a couple of backhoes and mini-excavators, a crane truck, a grapple truck and, probably the most interesting piece of heavy equipment, a HARD-LINE LP401 remotely controlled low-profile skid-steer loader. Among other tasks, the tracked LP401 is called upon to muck out silted stream beds near bridges.

The department has a CGI drone with which it monitors streams. It also has stream assessment gauges fixed in place at three places around town. The devices give real-time readings on data such as oxygen content, salinity and the pH level in the water. It's all good reading for department hydrologist Sean Aucoin.

### "By looking at deeper layers of issues at a location, we are able to monitor the stream more efficiently."

Sean Aucoin

"By looking at deeper layers of issues at a location (including the history of adjoining properties), we are able to monitor the stream more efficiently,"

says Aucoin. "Having the monitors in place prevents us from needing to go out there in person on a regular basis with the hand monitors." In the next year, three more of the fixed assessment monitors will be placed in streams on the eastern side of Frisco.

Surveying streams from the air with drones and monitoring moving water with the in-place gauges lets the depart-

### "We took a problem and turned it into a solution. That was a team idea."

Perry Harts

embankment in an eroded area. "We took a problem and turned it into a solution. That was a team idea."

Something similar was done using discarded Christmas trees. In an area of a stream where banks were badly eroded, the trees were anchored several feet apart and perpendicular to the stream. As water rose and fell after passing storms, silted material piled up against the evergreens. Plants of one kind or another then took root to further retard erosion.

The city has long required "water resource zones" adjacent to the parking areas of new developments. These areas filter pollutants from stormwater as it travels through the vegetation and into the soil. Unfortunately, most developers used exotic plants in the zones, which are not as sustainable as native prairie grasses and plants. When the city built a parking lot in 2015, the stormwater division created a different kind of absorption area as a demonstration project. The purpose was to show the advantages of using native plants and native soil in the zones.

The plot quickly became a self-sustaining natural area with deeply rooted plains, grasses and flowers. More importantly, infiltration tests showed the natural areas were amazingly more receptive to rainwater, quickly absorbing it and thereby reducing runoff. The comparison was stark: Engineered soils with sand content infiltrate at a rate of 3 1/2 inches an hour, whereas the natural areas suck down water at the rate of 51 feet an hour!

Another example of innovative thinking occurred when a stream was repeatedly blocked by beavers. The department responded by cutting a passage through the beaver dam with a mini-excavator and placing a length of flex culvert material in the trough. The ends stuck out several feet past the dam with cages protecting them against being plugged either by energetic animals or floating debris.

"We called it our beaver-deceiver," Harts says. The beavers returned and built their dam atop the culvert, but the water kept flowing beneath it through the pipe. Brandon Smith, stormwater supervisor, says the solution was a decisive one. "The beavers gave up trying to block the stream,

Frisco's Cottonwood Creek Trails is a popular recreation area for residents and creates a safe floodwater buffer for homes.







Sean Aucoin (left) and Brandon Smith examine the deposition progress resulting from a stream restoration project. Recycled Christmas trees were placed along a highly eroded creekbank to allow for sediment deposition.

Brandon Smith, Frisco stormwater maintenance supervisor, checks stream gauge data through the online portal using his smartphone. The system allows for 24/7 access to review stream stage levels and water quality parameters.



Clear visual evidence of the decreased water level is recorded on the concrete foundation of a bridge at the Cottonwood Creek Trail.



## WATERSHED EDUCATION

In fast-growing communities like Frisco, Texas, the rapid development, residential move-ins and business startups can easily translate into trash in the neighborhood and the streams passing through it.

That's where education comes in.

"Education is a big part of it," says Perry Harts, Frisco's stormwater manager. "There are 210,000 people in these watersheds and they can make a big difference."

Frisco has one person on the city payroll dedicated to stormwater education, outreach and public involvement. One presentation for K-5 students is described this way: "Students will learn about the different types of source pollutants and how they can help prevent those pollutants from entering our waterways. They will learn about the journey of one raindrop from the clouds to the ground, through our city streets and neighborhoods, into our waterways and back to our homes."

Adults are given hands-on learning experiences. "We had volunteers help take down a tree and we didn't have enough work for them. They were eager to do it again," says Harts, adding, "Another message to the community is, if you pick up an empty plastic bottle on a street, you are keeping it out of the creek."

Of course, there is a reason to keep trash out of the creek: It eventually ends up in one of the area lakes, which are depended upon by more than 5 million area residents. Harts says he tries to make that connection for residents by talking about the city's three watersheds.

"We use watershed maps for educational purposes, showing how they drain off into the drinking supply for the cities. We make an issue of watersheds to get people's attention, so they will realize someone will be drinking the water that discharges from their property."

ment keep close watch on streamwater and erosion along banks. Underground flows are inspected using cameras. When clogging conditions are seen there, an appropriate pipe cleaning response is initiated. "Most of our problems are identified through inspections," says Harts, meaning they are attentively ferreted out before they become big problems.

The expansion of the stream assessment gauge system suggests Frisco's stormwater crew will not rest on its gold award laurels. Harts says the stormwater team has talked about the need to keep pushing, to keep managing in innovative ways.

One planned response is to increase the use of unmanned aerial vehicles. "In the future, we want to do a lot more with drones. It's cheaper than putting an engineer in the creek and we get more accurate data. We can fly each creek a couple of times a year and find places that need attention."

The little unmanned aerial vehicles also are going underground. "The drone world really has changed in the last few years. We are looking at ways to use drones inside stormwater pipes, which is a real game-changer." Harts says not only does a drone not have to drag a cable into a pipe, the inspection cost less. Typical camera inspections cost about \$10 a foot, according to the stormwater manager.

The department also has begun to emphasize maintenance of separators on commercial properties. The devices are supposed to treat and control stormwater runoff after builders have moved on to other jobs and a property owner has assumed responsibility for runoff.

"An example is a strip mall that has a mechanical separator," says Harts. "If those devices aren't maintained, they are worthless. If you own a strip mall, you have lots of things on your mind, such as tenants and profits, and the mechanical separator is the last thing you think about. We have one stormwater inspector who is dedicated to looking at the separators post-construction."

If a separator is found to be non-functioning, the department has legal recourse. A department engineer approves a separation system during construction and, once approved, the developer is required to keep it working. If they don't, says Harts, "we can enforce it by ordinance." ♦



**NASSCO** is located at 5285 Westview Drive, Suite #202, Frederick, MD 21703; 410-442-7473; www.nassco.org

Sheila Joy is executive director of NASSCO. She can be reached at [director@nassco.org](mailto:director@nassco.org).

# WORKFORCE DEVELOPMENT AND THE ROLE OF LEADERSHIP

NASSCO is helping guide contractors and public agencies in the proper management of essential workers.

By *Sheila Joy*

A common challenge amongst trenchless technology contractors and public agencies is finding qualified field personnel to properly assess, maintain and rehabilitate underground infrastructure. In 2018, NASSCO identified the need to support our members through partnerships with organizations such as SkillsUSA by developing curriculum to help elevate the knowledge base and prestige in order to support and promote these jobs as solid, lifelong career opportunities.

Two years later the global pandemic hit and everything turned upside-down. With people spending so much time at home, it seemed the life/work balance weighed more heavily on the life side. For the most part, people did not want to return to an office environment, and those who work in the field were resistant to traveling and spending time away from their homes and families.

With this shift, NASSCO's Workforce Development Committee decided to take a step back and to better understand what field workers were really thinking. An online survey was launched last fall to individuals certified in NASSCO's Pipeline Assessment Certification Program and Inspector Training Certification Program. Only those who identified themselves as someone employed by a contractor or public agency and currently (or previously) employed as a field technician in the assessment, maintenance, and/or rehabilitation of sewer, water or stormwater systems were surveyed. Nearly 800 people responded.

The survey was designed to help uncover how easy (or hard) it is to currently find a good job in this field; how much training and education plays a role; why a field worker would accept a job and why they would leave one. For the most part, those surveyed believe they are marketable. When asked "Whether you are currently employed in this occupation or not, on a scale of one to 10, with 1 being 'I am desperate for a job' and 10 being 'I have no difficulty finding work', where would you rate your current potential to land a great job in this industry?" The average rating was eight.

Next, they were asked, "On a scale of one-10, with 1 being 'I wish they would teach me more' and 10 being 'I am an industry pro!', how would you rank the training and knowledge you receive (or received) at work?" The average rating for this question was seven, so we concluded that for the most part field technicians feel they are marketable and have the skills they need to work in the underground infrastructure field.

What surprised us most, however, was the reason the respondents would leave a job. Contrary to what we assumed, it isn't money, benefits, travel or training. It is poor leadership. In an unaided question, 84% of the respondents identified the following as reasons they would leave a company:

- Poor management
- Bad work environment/culture
- Difficult relationships with colleagues
- Lack of leadership
- Hostile work environment
- Lack of respect from management

Based on these findings, it is time for us, as an industry, to look inward. NASSCO's Workforce Development Committee has formed a Leadership Workgroup to identify ways to help guide contractors and public agencies in the proper management of these essential workers. To join NASSCO and to be part of the Workforce Development and many of its other dynamic committees, visit [www.nassco.org](http://www.nassco.org). ♦

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## THE ROLE OF THE COMPETENT PERSON

Recognizing and resolving hazards is key to a safe job site

By **Ronnie Freeman**

**T**he competent person role can be confusing at times as many definitions have been floating around for years with different meanings, different roles and sometimes differing opinions on what authority the competent person actually has. There is even confusion about what a “Qualified Person” is and sometimes the roles are mixed up or combined to create more confusion.

OSHA defines the competent person role as “one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.” This definition is found in OSHA’s Construction standard 29 CFR 1926.32 (f) for reference.

The qualified person is defined as one who, by possession of a recognized degree, certificate or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project. This definition is found in OSHA’s construction standard 29 CFR 1926.32 (m) for reference.

Basically, the qualified person is one who through engineering or some other means can solve a problem relating to a hazard, while a competent person can recognize the hazard and has the authority to correct the hazard or can halt work until the hazard is corrected. Sometimes, that means bringing in the qualified person to address the hazard because a more technical solution is required, and this is where the difference is made.

**The employer must give the competent person the authority to correct hazards and must also ensure that the person has the knowledge to identify existing or predictable hazards.**

The type of work where a competent person should be available includes work zones, confined spaces, fall hazards, scaffold erection, cranes and trenching and excavation work. Generally, the competent person is authorized by the employer to ensure safety on a job site and has the expertise to recognize those hazards that need immediate attention.

It is important to understand that there is no OSHA test or specific training that makes an individual a competent person. The OSHA 30-hour course does not make someone competent either, mainly because classroom instruction and tests don’t necessarily give an individual the knowledge to recognize specific hazards, nor do they give the individual the authority to make corrections. This type of training helps but doesn’t guarantee knowledge, especially when you are on a job site with hazards that weren’t specifically addressed in the classroom. The competent person, however, should be familiar with the OSHA standards for the work being performed.

The employer must give the competent person the authority to correct hazards and must also ensure that the person has the knowledge to identify existing or predictable hazards. The company can also assign multiple competent per-

sons depending on the size and complexity of the job.

If an OSHA inspector shows up on the job site one of the first questions asked will probably be who the competent person is onsite. Employees had better be able to point that person out so it’s important for the designated competent person to be known to all on the job site. This is typically going to be the foreman or supervisor. The OSHA inspector will want to talk to the competent person and ask questions pertaining to the work being done in regard to certain OSHA standards. If you do not have someone onsite designated as the competent person your company can be cited for failing to provide a competent person onsite.

Choosing the right competent person is vital to your job’s success as well as making sure you are within OSHA standards for safety. Obviously, someone who has the experience and knowledge for the type of work being performed — including the hazards — is step one. This person also must understand the responsibilities of being a competent person and be familiar with OSHA standards for the work being performed. Before designating the competent person, it’s important that the person meets the criteria as described above. ♦



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# TEACHING RESPONSIBLE BEHAVIORS

A Florida water management district's grant program has made a substantial impact on students and educators

By **Sandra Buettner**

A water management district's Splash! School Grant Program has benefited more than 60,000 students from 12 counties in the past 10 years.

The Southwest Florida Water Management District created the program to equip educators with freshwater resources education for K-12 public and charter schools.

The district, with offices in Brooksville, Tampa, Sarasota and Bartow, covers 10,000 square miles in all or part of 16 counties and serves a population of about 6 million. Its mission is to protect water resources, minimize flood risks and ensure that the public's water needs are met.

### Diverse activities

Grants can cover a wide range of activities. "There are so many choices listed on our website, but one of the most popular seems to be field trips," says Katherine Munson, senior communications coordinator. On those trips, kids see their local waterways firsthand.

One popular activity is creating and observing a water conservation project right at the schools such as planting a garden using hydroponics. "One of the more unique activities was a puppet show written and created by students on the water cycle," Munson says. "The students invited the parents to the production, and it was a big hit with them."

The program is promoted through the district's website and through social media. The district has an email list of 3,000 educators and science coordinators. Every year emails remind them about the grants available.

**"The students invited the parents to the production, and it was a big hit with them."**

**Katherine Munson**



### In big demand

Applications for grants run from July through September. Teachers apply online and work on applications during summer or shortly after the start of the school year in mid-August. Because so many applications are submitted, a lottery system is used to narrow the field. The selected projects are reviewed, and on average about 60 grants are awarded each year.

Grants provide up to \$3,000 per project per school year (mid-August to mid-May). The grant money comes via funds from ad valorem tax dollars collected throughout the district's 16 counties. School districts with larger populations get proportionately more grants.

Over the past 20 years, more than 2,040 grants have been awarded, totaling more than \$4 million. Most teachers who apply are STEM educators, but the district also gets submissions from agriculture and English teachers.

### Ideas and activities

Some activities eligible for grants include:

- Using a model to observe the water cycle process
- Writing a book or play following a water drop through the water cycle
- Inviting a guest presenter to lead students in a hands-on demonstration
- Going on field trips to explore a local freshwater or estuarine ecosystem
- Water-quality testing

### Getting results

Educators applying for grants must complete an application that details how they will use the money and what items they will need.

Grant-funded projects require a pre-test and post-test for the students. The district website provides some sample questions, but teachers are responsible for creating the tests, which measure how much the students have absorbed and learned.

Melissa Gulvin, the district's communications manager, observes, "Teachers

**We invite readers** to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Luke Laggis at 800-257-7222, or email [editor@mswmag.com](mailto:editor@mswmag.com).







report the knowledge gain for their classes, which program-wide has averaged 32% over the past 10 years. The information from the testing also helps the district justify continuing the grant program.”

The students use what they learn to remind each other and family members about adopting more water-conserving responsible behaviors. Parents may receive flyers about the project their children are working on or can be part of an at-home activity.

Says Munson, “One of the biggest comments we hear from the teachers is that this is the first time most of their students have visited their local waterway, even though here in Florida we are surrounded by water and wetlands.” ♦



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# Product Spotlight

## Test-Ball Plug blocks pipe up to 120 inches

By **Craig Mandli**

Blocking a pipeline is a requirement during new installation or maintenance when either effluent flow needs to be temporarily stopped or when a new pipe is being air-tested for leaks. Blocking plugs effectively hold back air or water and are used inside a municipal sewer pipe to seal it from outside materials. But until now Cherne's version of these plugs were limited to use only in pipes 96 inches in diameter or smaller. The I-Series Test-Ball Plug brings the technology up to size, handling pipe from 72 up to an incredible 120 inches.

The world's largest test ball, it blocks flow in the biggest pipes in sanitary and storm sewer systems. According to Asim Syed, director of product development and R&D for Oatey, it was carefully developed with an optimized design that offers improved performance and safety.

"At 850 pounds and 152 inches long, the Test-Ball Plug is made of 100% natural rubber," says Syed. "As a result, it has the superior ability to conform to pipe surfaces, as well as greater tensile strength and longer working life. Other similar-sized plugs on the market are not assembled with natural rubber material."

Accommodating a back pressure of up to 6 psi, the plug features 3/4-inch eyebolts that provide superior holding strength. A field-replaceable pressure relief valve prevents over-inflation, and an aluminum end plate minimizes rust



and corrosion.

"When job site conditions call for a test plug of this size, we know safety and performance are paramount," says Syed. "That's why we've engineered the world's largest test plug with the same quality control and manufacturing standards that Cherne is known for worldwide."

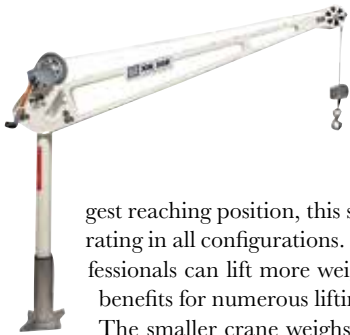
According to Syed, the R&D team developed several prototypes. After making improvements to each, the team finalized the design after the fourth prototype, ensuring the highest quality. A fifth prototype was made for assurance and to demonstrate consistency of performance and results. Testing for one prototype would take about two and a half weeks, thus taking five months before finalizing the plug design.

"While not all municipalities or utility contractors will need a 120-inch Test-Ball Plug, it ensures availability for customers who may need it for specific projects down the line," he says. "Product demand is higher than ever, and urban sprawl is increasing, meaning more water collection and bigger pipes." **952-933-5501; www.cherneind.com**

### SPECIAL REPORT

## OZ Lifting XR Series davit cranes

OZ Lifting Products has launched its XR Series of davit cranes for wastewater and water operators. The Winona, Minnesota-based manufacturer has released the model in 500- and 1,000-pound capacities, but the long reach of the range is a stand-out benefit for operators. Where other davit cranes typically have reduced capacity when it is in the longest reaching position, this series maintains its maximum capacity rating in all configurations. This means wastewater and water professionals can lift more weight, further out, which presents many benefits for numerous lifting and material handling applications.



The smaller crane weighs only 57 pounds and the larger crane weighs 95 pounds. Both have a maximum 62-inch reach and maximum hook height of 87 inches.

**800-749-1064; www.ozliftingproducts.com**

## ADS Environmental Services ParaFlow sensor

ADS Environmental Services' new ParaFlow is a non-contact, area-velocity sensor that combines velocity, depth and water temperature data collection into a single device. The sensor is used with the ADS TRITON+ flow monitor, enabling wastewater collections system users to acquire accurate depth and velocity data with a non-contact sensor. ParaFlow can



also be used in concert with other ADS submerged sensors providing measurement redundancy. The ParaFlow sensor measures these key parameters: depth, using noncontact ultrasonic depth; surcharge pressure depth; surface velocity; surcharge continuous-wave Doppler velocity; and water temperature. The sensor's polycarbonate housing is highly durable and impact resistant.

**800-821-6710; www.adsenv.com**



## Vermeer Verifier G3+ utility locator

Vermeer's new-generation Verifier G3+ utility locator delivers high accuracy, optimized connectivity and intuitive controls. It pairs with smartphones using the G3+ Map mobile app to plot location information, including depth, current index, GPS data,



utility type, device name and the operator who performed the work. The GPS-enabled utility locator can determine underground current direction against adjacent signals from other utilities. It can detect ambient noise so the operator can switch to a different frequency for a particular job site. Also, operators can adjust transmitter frequency and power outputs from up to 500 feet away using a wireless connection. Saved data from the locator is transferred using Bluetooth 5.0 to the G3+ Map app. The data can also be uploaded to the Vermeer Projects bore planning tool. The Vermeer Verifier G3+ offers operators three locating modes: peak, peak/null and null. 352-728-2222; [www.vermeer.com](http://www.vermeer.com)

## Trinnex leadCAST Predict modeling software

Trinnex's leadCAST Predict is a new predictive modeling tool that improves water utilities' ability to optimize their resources to achieve Lead and Copper Rule Revisions compliance. The tool is designed to predict and classify unknown service line materials to reduce the presence of lead in community water systems. leadCAST Predict is part of Trinnex's larger end-to-end LCRR compliance solution, leadCAST, and supports two types of water utilities: those with lead service lines that need to prioritize getting the lead out; and those with no lead service lines that need to prove the existence of acceptable materials. leadCAST Predict users get results in an interactive dashboard and map views, along with an easy-to-follow report with an overview of how the machine-learning models were built, deployed and tested. [www.trinnex.io](http://www.trinnex.io) ♦



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# CHEMICAL AND MECHANICAL ROOT CONTROL

## Cable Machines

### Duracable DM55

When up against a sewer line that's been infiltrated by tough tree roots, the **DM55 machine** from **Duracable** can be used. With the versatility to clear obstructions from 2- to 10-inch lines, it is suitable for municipal, commercial and residential work. The direct-drive 10-1 gear box ratio provides all the torque needed to tackle heavy roots. A power cable feed and return on this machine makes it easy to use. It comes standard with 110 to 150 feet of 11/16-inch hollow core cable in a 26-inch reel, but the user can switch to 3/4-inch cable when needed. Duracable's lineup of tough, heat-treated and coated blades make it ready for any root removal job. **800-247-4081; www.duracable.com**



### Electric Eel Model C

The **Model C dual-cable sectional drain cleaner** from **Electric Eel** runs up to 200 feet of 1 1/4-inch, self-feeding dual cable in 8- or 10-foot sections that require no handling when rotating. It spins cable at twice the revolutions per minute of a continuous cable machine for cleaning 3- to 10-inch lines for distances up to 200 feet. One-person operation means less time and labor expense. A heavy-duty, 1/2 hp motor comes standard, and 3/4 and 1 hp motors are also available. A custom-designed gearbox ensures higher quality, lower cost and parts availability. The heavy-duty, fully adjustable safety clutch keeps cable and tool breakage to a minimum and provides overload protection. A fold-down handle allows for easy transport, storage and use in crawl spaces. Its carry handle allows for balance and easy transport. **800-833-1212; www.electriceel.com**



### General Pipe Cleaners Flexi-Rooter 100

The **Flexi-Rooter 100 high-speed, flexible-shaft drain cleaner** from **General Pipe Cleaners** has a shaft that spins more than 10 times faster than cable drum machines to quickly grind up stoppages and scour pipe walls. Its stronger, stiffer shaft is flexible enough to navigate 2-inch pipes, yet strong enough to cut roots in 4-inch drainlines up to 75 feet long. The variable-speed motor easily lets you adjust shaft speed from 0 to 2,200 rpm. Its safe foot pedal control frees both hands to guide the flexible shaft into the line. Operators can simultaneously use it with a sewer camera system to pinpoint pipe troubles and instantly inspect results. Its cleaning array features ClogChopper cutters at the business end combined with carbide chain cutters. The shaft is field-repairable. **800-245-6200; www.drainbrain.com**



### Gorlitz Sewer & Drain Model GO 68HD

The **Model GO 68HD heavy-duty electric drain cleaning machine** from **Gorlitz Sewer & Drain** is available in two different versions, either with an open steel reel or enclosed polyethylene drum, and it can be outfitted with an optional power feeder. Standard configuration is 150 feet of 11/16-inch hollow-core cable, which should reach most blockages with a single reel. Overall weight of the machine is 185 pounds. Adding a loading ramp and electric winch to any vehicle makes transportation quick and simple. It is designed to clean pipes from 3 to 8 inches in diameter. **877-446-7548; www.gorlitz.com**



### Milwaukee Tool MI8 FUEL Sewer Sectional Machine

**Milwaukee Tool's M18 FUEL Sewer Sectional Machine with CABLE DRIVE Automatic Feed and Retract** has the power to clear tough blockages in 2-to-8-inch sewer lateral lines. The **POWERSTATE Brushless Motor** and **RED-LINK PLUS Intelligence** delivers the power to clear roots up to 200 feet out, providing full power at the maximum capacity of the machine. The sewer cable machine features **CABLE DRIVE Automatic Feed and Retract** system. This system reduces user fatigue by eliminating the need to manually pull back the heavy cable from the pipes. An enclosed cable carrier ensures the best protection and mess containment during transportation and can be stacked for easier storage. The sewer sectional is compatible with **ONE-KEY**, so it can be wirelessly tracked, managed and secured. **800-728-3878; www.milwaukeetool.com**



### RIDGID FlexShaft Drain Cleaning Machine Accessories

**RIDGID FlexShaft Drain Cleaning Machine accessories** are designed to provide wall-to-wall cleaning in 1 1/4- to 6-inch residential and commercial pipes in conjunction with any RIDGID FlexShaft model. Accessories include a variety of chain knockers and brushes designed to quickly clean pipe. Chain knockers come in standard, carbide-tipped or penetrating-head versions that expand to the size of the pipe, clearing the entire pipe circumference of grease, sludge, small tree roots and soft blockages with less mess and enhanced speed. Additional accessories include 1/4- and 5/16-inch DeadCore Cables, designed for the FlexShaft K9-102 and K9-204, that are stiffer and easier to repair for milling applications, and nylon and nylon/steel brushes to deliver final pipe cleaning and relining preparation. FlexShaft machines allow for inspection cameras to remain in-pipe throughout the entire drain cleaning process for maximum efficiency. **800-474-3443; www.ridgid.com**





## Cutting Nozzles

### Arthur Products Cnt-r-KUT G2 EMAX2

The **Cnt-r-KUT G2 EMAX2** from **Arthur Products** is an interchangeable cutter nozzle to clear roots and debris. The centering devices can be modified for custom applications. They help operators tackle tough jobs, including when using drain cleaning nozzles in tight spaces in damaged sewers. Technicians can expect to achieve maximum cleaning spread in drains and other pipes.

800-322-0510; [www.arthurproducts.com](http://www.arthurproducts.com)



### Enz USA Golden Jet 10.060A/B/CTR turbine nozzle

With operating flows as low as 8 gpm at 2,000 psi, the **Golden Jet 10.060A/B/CTR turbine nozzle** from **Enz USA** is a powerful cleaning tool. The turbine design allows for lower flow and less water usage while maintaining high torque for effective pipe cleaning in lines ranging from 2.5 to 8 inches. Because of its sealed bearings, this nozzle can be operated with both clean and recycled water while being relatively maintenance-free. This compact, efficient nozzle is a powerful root remover and is suitable for use on grease, solids, mineral deposits, concrete and grout. Its complete kit provides a selection of pre-cut chains, skids and two head styles. 877-362-8721; [www.enz.com](http://www.enz.com)



### Hydra-Flex Revolution

The **Revolution** from **Hydra-Flex** utilizes the same cutting and jetting power of the Reaper line but adds 360-degree cleaning power with its center, rotating sub-head. The sub-head contains dual rotating jets that work to completely clean and descale the inside of the pipe. Unlike other nozzles on the market, the Revolution sub-head is built to stay at a consistent speed, which means the same quality results throughout the duration of its life. Its premium material make-up consists of stainless-steel housing and tungsten carbide wear surfaces, which make it extremely durable and capable of withstanding harsh environments. This tool is built for 6- to 36-inch sewer pipes and breaks through tough blockages, FOG and roots, jetting through pipes and cleaning at the same time.

952-808-3640; [www.hydrflexinc.com](http://www.hydrflexinc.com)



### Root Rat cutting nozzle

**Root Rat cutting nozzles** are used with jetters from 11 hp to large truck-mounted models. The cutters are made of hardened stainless steel and come with a toolbox with two interchangeable rotors — one with cables and the other with chains. The combination kit includes extra chain, cable and bearings. They need no repair or rebuilding other than bearing replacement, which can be completed in less than two minutes for under \$10 in parts. 800-288-7873; [www.rootrat.net](http://www.rootrat.net)



## Jetters

### American Jetter 58 Series Inferno Burner Hot Jetter

The **58 Series Inferno Burner Hot Jetter** from **American Jetter** offers up to 67% more efficient heat over traditional burners. This super fuel-saving hot water system packs extra cleaning power for grease cutting and deicing. Consistent power comes from a 38 hp EFI Kohler gasoline engine with flows up to 20 gpm and pressure to 5,000 psi. The rear speed control reel provides precise cleaning speeds and easy access to the jet hose with the included hose guide. Low water shutoff stops the engine if the 220-gallon tank runs low. The optional 1-mile open range wireless remote option features water ON/OFF, engine shutdown and hose reel control. The heavy-duty square tubing trailer has a 2-inch ball coupler and standard electric brakes.

866-944-3569; [www.americanjetter.com](http://www.americanjetter.com)



### Cam Spray 3012H Compact Skid Mount Jetter

The **3012H Compact Skid Mount Jetter** from **Cam Spray** is designed for a high cube van or pickup bed and takes up as little space as possible while providing 12 gpm at 3,000 psi. Features include a Honda iGX800 fuel-injected gasoline engine with oil alert and hour meter, powering a gearbox-driven plunger pump with ceramic plungers, stainless steel valves, pressure gauge and 80-mesh water filter. The pump is protected by an unloader valve and secondary pop-off. A power pulse feature is used for navigating longer runs and elbows. The 100-gallon tank includes low water shut-off and a float valve to manage filling the tank. An industrial-coated skid platform and frame offers transferability among vans, trucks and trailers, while mounting flanges and d-rings allow for the machine to be fastened or tied down. The machine measures 52 inches long by 41.5 inches wide by 50 inches tall. 800-648-5011; [www.camspray.com](http://www.camspray.com)



### GapVax G7 Jetter

The **G7 Jetter** from **GapVax** is built on a heavy-duty, contractor-grade NATM-certified trailer. Several engine choices, including Cummins diesel, are certified and sized appropriately for the water pump combinations. The unit's hose reel is hydraulically powered with a direct-drive gearbox and variable-speed control. The hose reel offers a 3-foot (curbside) articulation from center of bearing, 180-degree rotation and a capacity of 800 feet of 3/4-inch jetter hose. The polyethylene plastic water tank is available in 300-, 500-, 600- or 700-gallon capacities. The water pump is center-fed for optimum performance. The controller is interlocked with safety features that will show low fuel levels and low water, and is capable of a complete engine shutdown in an emergency. 888-442-7829; [www.gapvax.com](http://www.gapvax.com)



### Hi-Vac O'Brien 3500 Series Water Jetter

The **O'Brien 3500 Series Water Jetter** from **Hi-Vac** delivers power in a lightweight design for sewer line, basin and culvert cleaning. Ideal for commercial, industrial and residential projects, it provides pressure capabilities up to 4,000 psi and flow ranges from 10 to 40 gpm. The single-



(continued)

# PRODUCT FOCUS

## CHEMICAL AND MECHANICAL ROOT CONTROL

axle trailer provides impressive maneuverability for working in areas where space is limited or in residential areas where a smaller footprint is required. A 190-degree, hydraulically driven hose reel allows for easy access to the manhole regardless of the position of the trailer. It features a rugged frame design for heavy-duty applications and a Tier 4 Final, U.S.-made diesel engine for more torque at a lower noise level. A tough polyethylene tank stands up to harsh weather conditions.

800-752-2400; [www.obrienmfg.com](http://www.obrienmfg.com)

### HotJet USA HotJet II

The **HotJet USA HotJet II trailer-mounted jetter** is available with hydraulic hose reels and a 37 hp Vanguard fuel-injected engine. Operating with hot or cold water, it runs at 12 gpm at 4,000 psi, cleaning 2- to-12-inch lines, making it an alternative between small-output and larger-output machines. It arrives turnkey with a 330-gallon water tank, detergent tanks and full power-washing capabilities for cleaning, disinfecting and sanitizing after the job. It includes a hydraulic hose reel, heavy-duty 7,000-pound-rated tandem axle trailer (single axle also available), rear control panel with remote control, two heavy-duty diamond-plate side toolboxes and one front toolbox.

800-624-8186; [www.hotjetusa.com](http://www.hotjetusa.com)



### Mongoose Jettors 184

The **Enz 10.060B-TR Chain Scraper** along with the **Mongoose Jettors 184** can do an ideal job of descaling cast iron pipes, removing tree roots, hard mineral deposits and concrete residue from newly installed sewer lines. When switching the head to a milling cutter head, it has been able to remove hard concrete in 2-to-4-inch lines. The nozzle can alternate from link chain to bicycle chain that has manganese plates at the end and different size skids to centralize the nozzle. It can operate in 2-, 4-, 6- and 8-inch pipes.

877-735-4640; [www.sewerequipment.com/mongoose-jettors/](http://www.sewerequipment.com/mongoose-jettors/)



### MyTana Compact Jettors

**MyTana** offers two compact and budget-friendly **truck-mounted jettors** suitable for medium-duty work vans and box trucks. Each delivers 15 gpm at 4,000 psi for work in lines up to 24 inches. The smaller Economic has a hydraulic hose reel which swivels 225 degrees and holds 300 feet of 1/2-inch hose. A second reel is for a water fill hose. The EcoFit features three reels. Two hydraulic hose reels swivel 270 degrees along with the control panel, each with a hose entry guide. The main reel has 300 feet of 1/2-inch hose but could hold up to 550 feet of hose. The second reel can hold up to 300 feet of 1/2-inch hose. A third reel houses the water fill hose. Both models include a handheld remote-control unit and pulse action. They are built by ROM. 800-328-8170; [www.mytana.com](http://www.mytana.com)



### Super Products SuperJet

The **SuperJet truck-mounted jetter** from **Super Products** is used to blast debris to clear blockages and maintain sewer lines when vacuuming extraction is not required. It uses a strong and smooth single-piston water pump to create con-



sistently high water pressure. Units come standard with rotationally molded polyethylene water tanks in a modular design to accommodate water capacities ranging from 1,080 to 3,240 gallons. Additionally, they offer convenient standard curb-side and street-side fill. The hose reel has 1,000 feet of 1-inch-diameter sewer hose, 200-degree rotation and a digital monitor. This allows operators to work efficiently while positioning themselves out of traffic and away from other hazards. The monitor displays a hose footage count, offers 20 saved settings for hose reel payout and is designed with LED panel lights to enable readability in a variety of environments.

800-837-9711; [www.superproducts.com](http://www.superproducts.com)

### Vacall AllJet

**Vacall's AllJet truck-mounted jetter** is an easy-to-operate, efficient sewer root maintenance machine. The hydraulically powered triplex plunger water pump is capable of 87 gpm at 2,000 psi with other power options available. The hose reel telescopes out 54 inches from a retracted position and swivels 200 degrees to properly direct the 600-foot jetting hose. It uses a single-engine PTO design, and a 1,600-gallon UV-resistant polyethylene water tank. Operator-friendly features include four locking aluminum tool storage cabinets, a rear-view camera, roll-up doors and a washdown system, with options including LED lighting packages, an extendable rear canopy and a heating and insulation package inside the all-aluminum rear compartment. 800-382-8302; [www.vacall.com](http://www.vacall.com)



### Vac-Con VJ Series

The **VJ Series of jettors** from **Vac-Con** is designed to provide operators with an economical, portable and powerful system in two configurations. The VJ375 offers a 375-gallon water capacity on a single-axle trailer. The VJ750 boasts 750-gallon water capacity on a tandem-axle trailer. Standard features include Tier 4 diesel engine, cold-weather recirculation and air purge system, hydraulically driven hose reel and a reel-mounted, weatherproof electronic control panel. Units are available in multiple water pump pressure and flow configurations. Optional features include gas engine, wireless remote and an antifreeze tank system for cold-weather use. 904-284-4200; [www.vac-con.com](http://www.vac-con.com)



## Mechanical Root Cutters

### SewerProShop Blue Star Raptor and Viper

**Blue Star Raptor and Viper chain cutters** from **SewerProShop** are made of high-grade stainless steel and are furnished with ceramic nozzle inserts. With the Raptor, choose from 4- and 6-inch rigid skids or a 6- to-12-inch flexible guide skid, along with cutting chains and carbide bits to achieve quick solutions. Viper chain cutters are designed to remove heavy obstructions caused not only by roots, but grease, mineral deposits and other solid organic material. The unit is driven by a high-performance turbine, which doesn't require any lubrication. Chains spin at speeds of 4,000 to 12,000 rpm. Multiple guide skids available in various sizes provide a service range of 4 to 48 inches. The Viper can be operated with recycled water.

877-864-9394; [www.sewerproshop.com](http://www.sewerproshop.com)





## PRODUCT FOCUS

### USB-USA Turbo chain cutters

The heavy-duty **Turbo chain cutters** from **USB-USA** are tough and powerful. These cutters continuously adjust from 8 to 15 inches (Turbo S200) or 12 to 24 inches (Turbo S600) and easily fit into the pipe. Turbine technology powers the durable chain retainer on a robust body to remove roots, concrete, calcium deposits, hardened grease and tuberculation from sewer lines. They are designed to be very aggressive for the hardest materials. The beefed up, heavy-duty cutters have double the amount of turbine driving water jets as the company's other cutters, generating tremendous cutting power. Easily adjust the cutter to within 1/16 inch by spinning the rear to make it larger or smaller. Internal 3D fluid mechanics in conjunction with one-piece ceramic nozzle inserts allow the cutter to be used with recycled or clean water.



844-285-5770; [www.usb-usa.com](http://www.usb-usa.com)

## Root Chemicals

### Lenzyme Trap-Clear foaming root control

Foaming root control from **Lenzyme Trap-Clear** has double the active ingredient, dichlobenil, compared to previous solutions, along with a latex base designed to help it stick to roots longer. It is easy to apply and provides a slower foaming action to coat the entire pipeline and eliminate fast-foamover messes.



800-223-3083; [www.lenzyme.com](http://www.lenzyme.com)

### Oatey Hercules R-D Root Destroyer

**Hercules R-D Root Destroyer** from **Oatey** is a slow-dissolving, nonacidic, noncaustic herbicide formulated to eliminate and prevent root growth in sewer lines. By preventing sump and ejector pump root damage, it eliminates overflow damage, sewage flow restriction and backup odors. It is safe to use in lines leading to septic tanks, cess-pools and dry wells, and is harmless to the environment.



### RootX

**RootX** comes in 2- and 4-pound containers. A 2-pound container is designed to treat 50 feet of 4-inch sewer line and a 4-pound container is designed to treat 100 feet of 4-inch or 75 feet of 6-inch sewer line. With the funnel/applicator it is easy to apply. Simply attach the funnel and cap to the top of the jar and shake back and forth for approximately a minute. Remove the cap and pour it into the toilet or cleanout and immediately follow it with the appropriate amount of water for the application. Restrict water usage for a minimum of 4 hours. Annual treatments are recommended. Septic tanks can also be treated simply by using 8 pounds per 1,000-gallon tank. Pump the liquid down just low enough to expose the roots. Apply the RootX to the root-infested area and add water to activate the foam.



800-844-4974; [www.rootx.com](http://www.rootx.com) ♦



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**Franklin Electric announces 2022 recipients for outstanding achievement**

At its annual Commercial Summit, Franklin Electric announced the winners of this year’s awards for outstanding performance, sales and customer support. Recognized were U.S./Canada Salesperson of the Year Aaron Jackson; U.S./Canada Field Service Engineer of the Year Walter Leake; U.S./Canada Team of the Year Fleet (part of the industrial and engineered systems business unit); Latin America Sales Leader of the Year Luis Caso; and Latin America Team of the Year Argentina.

**FYLD appoints Joshua Wood as director**

FYLD, an AI-powered digital platform that enhances the safety and productivity of fieldworkers, has appointed Joshua Wood as director, water sector, a newly created role. As part of the leadership team, he will work closely with the product development, business development and client delivery teams. Wood brings nearly a decade of operations management experience to the role, having held various positions within FYLD and Thames Water.



**Joshua Wood**

**120Water named Cherokee Nation LCR database of record**

120Water has been selected by the Cherokee Nation as its Lead and Copper Rule database of record. The partnership will expand on a successful pilot carried out earlier this year, assisting in the preparation of Lead Service Line Inventories for 25 small systems across Northeast Oklahoma.

**Mike Flynn retires from Felling Trailers**

Felling Trailers’ Northeastern Regional Sales Manager Mike Flynn bids farewell to life as a trailer sales rep after 22 years with the company. In 2000 Flynn signed on with Felling Trailers as an independent trailer sales rep for the Northeast region covering Pennsylvania, New York, Vermont, New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, New Jersey, Maryland, D.C. and Delaware. Throughout his time with Felling Trailers, he grew the company’s dealer base and brand awareness, becoming a leader in the trailer manufacturing space with over 50 dealers throughout the northeast region. ♦



**Mike Flynn**



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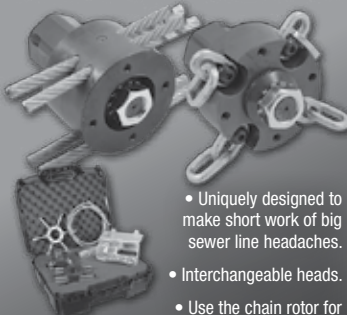
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## PEOPLE/AWARDS

The **town of Westfield** received a 2023 Stormwater Management Award from the New Jersey Clean Communities Council for its Adopt-A-Drain Program. The program has residents sign up to adopt specific storm drains that they then commit to keeping clear of debris. The program provides drain keepers with tips on how to keep the drains clear and offers a tool to help people record how much debris they've gotten out of the gutter.

The **city of Hendersonville** received a \$3.42 million grant from the North Carolina Division of Water Infrastructure and North Carolina Land and Water Fund that is designed to help reduce flood risk and restore floodplains in the city's southside and continue the development of the city's Comprehensive Stormwater Master Plan.

**Clayton County** (Georgia) is receiving \$2.6 million from the Environmental Protection Agency to address the county's stormwater infrastructure issues. ♦

## CALENDAR

### July 17-19

American Water Resources Association Summer Conference, Hyatt Regency Denver Tech Center, Denver. Visit [www.awra.org](http://www.awra.org).

### Aug. 29-31

StormCon 2023, Sheraton Dallas Hotel, Dallas. Visit [www.stormcon.com](http://www.stormcon.com).

### Sept. 11-13

California Stormwater Quality Association Annual Conference, Paradise Point Resort, San Diego. Visit [www.casqa.org](http://www.casqa.org).

### Oct. 3-4

American Public Works Association-Utah Chapter Fall Conference and Stormwater Expo, Mountain America Expo Center, Sandy, Utah. Visit [utah.apwa.net](http://utah.apwa.net).

### Oct. 4-6

Southeast Stormwater Association 2023 Regional Stormwater Conference, location TBA. Visit [seswa.memberclicks.net](http://seswa.memberclicks.net).

### Oct. 17-20

Utah Floodplain and Stormwater Management Association 2023 Conference, Cedar City Courtyard Marriott Hotel, Cedar City, Utah. Visit [www.ufsma.org](http://www.ufsma.org).

### Nov. 1-2

Wisconsin Association for Floodplain, Stormwater and Coastal Management 2023 Conference, Hyatt Regency Hotel, Green Bay, Wisconsin. Visit [wafscm.org](http://wafscm.org).

**Municipal Sewer & Water** invites your national, state or local association to post notices and news items in this column. Send contributions to [editor@mswmag.com](mailto:editor@mswmag.com).

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